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AUTHOR Alschuler, Irene
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ABSTRACT

This study showed the effectiveness of two parent education programs designed to increase young children's sustained attention to verbal stimuli. Forty 18- to 24-month-old children and their mothers served as subjects under three different conditions: Full Treatment Program of home training, home visits, group meetings for mothers, and curriculum materials; Partial Treatment Program of home training and visits and no educational materials or group meetings; and No Treatment. The mothers in the Full and Partial Treatment Groups modelled new and expanded action and verbal patterns during daily, familiar activities in the home during a 3-month period. Measurements of sustained attention included a mental development scale, a rating of language development, and a Sustained Attention to Verbal Stimuli Scale developed for the study. Results showed that the Full Treatment Program was significantly more effective for increasing young children's sustained attention to verbal stimuli than the Partial Treatment Program and the No Treatment. Theoretical and practical aspects of these results are discussed. (Author/CS)

A PARENT EDUCATION PROGRAM FOR INCREASING YOUNG CHILDREN'S SUSTAINED ATTENTION TO VERBAL STIMULI

[ALSCHULER, IRENE]

A number of studies suggest that an important condition for learning and cognitive development is sustained attention to verbal stimuli. (Kagan, 1965; 1968; 1969; 1970; Piaget, 1967; Bruner, 1969; Staats, 1968). In addition to contributing information with or without a visual event, speech orients a child spatially and temporarily to a learning situation. Piaget's theory (1967) suggests that attention to verbal stimuli is necessary if the stimuli are to become part of, and help form existing cognitive schemata.

Some studies show that the development of sustained attention to verbal stimuli begins in early infancy, (Bruner, 1969; Kagan, 1965, 1968). In the first few months of life, attention is directed outward and guided by a primitive internalized schema. At approximately sixteen weeks, attention becomes more under the control of the infant for as action schema develop the infant is able to attend to anticipated events. The internalization of the determinants of attention continues so that by the age of two, sustained attention is primarily a function of the child's cognitive development; i.e. the child's action and verbal schema and the extent of his symbolic thinking.

Piaget's theory (1951) suggests that an important period in the development of sustained attention to verbal stimuli would be between the ages of eighteen and twenty-four months of age. During this period, the child appears to have an increased capacity to represent reality throught images and symbols. Piaget believes that this capacity for employing images and symbols is both a function of and a determinant of several changes in imitative behaviors; the child is more efficient in imitating complex, new, modelling acts, more capable of imitating objects as well as persons, and the child more often shows deferred imitation; that is , the child can reproduce the behavior of a model who is no longer present. Deferred imitation would seem especially important for the development of sustained attention to verbal stimuli. In deferred imitation, the modelled act becomes interiorized and constitutes sketchy images, that the child can use to anticipate future acts,e.g. the child listens to spoken words before acting.

Bandura's studies (1969) of observational learning offer additional evidence for the importance of imitation by suggesting that the number of , and the complexity of a child's stored images and words determine the number of responses that can be retrieved and reproduced, that is the amount of verbal and action schema that can be tested, and the length of sustained attention.

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In summary, the evidence does suggest that to increase the development of a young child's sustained attention to verbal stimuli, the developmental period of eighteen to twenty-four months of age would be an important time. With the child's increased capacity to imitate and to have deferred imitation, an increase in the complexity and number of observable modelling acts during this period would most likely increase the number and complexity of stored images and words and, concurrently, more sustained attention to verbal stimuli.

A number of studies, (Witken et.al., 1962; Brown and Fraser, 1964; McNeill, 1966; Kagan, 1970b; Marans et.al., 1968; Schaefer, 1969; Gordon, 1969) have indicated that the mother is one of the most important persons for modelling words and action patterns during her child's developmental period of eighteen to twenty-four months of age. Thus, it appears reasonable that one way to increase a child's attention to overall stimuli would be to train the mother to model new and more word and action patterns when her child is eighteen to twenty-four months of age. This general conclusion is borne out in a number of studies dealing with the relationship between language development and patterns of mother-child interactions, (Hess & Shipman, 1965; Hunt, 1967; Pavenstedt, 1965; Baratz, 1969; Bee, et.al., 1969; Cazden, 1970; Hymes, 1970; Tough, 1970; Nelson, 1971). Much of this research concerns differences in language development as a function of the level of parents' socio-economic status. However, this way of defining the independent variable should not distract attention from the assumption that it is the differences in mother-child relationships that seem to make the difference in rate of language development as defined by the child's observable use of words and vocabulary. The implications from these studies is that in addition to the number of parent modelling acts, the differences between these acts influence language development and would assumedly influence sustained attention to verbal stimuli if the general theory is that both language development and sustained attention to verbal stimuli are functions of cognitive development. However, an increase in sustained attention to verbal stimuli would not necessarily mean an increase in observable language behavior since it deals more with the child's internal processes of using stored images and words for anticipating future responses. It does seem probable though, that an increase in sustained attention to verbal stimuli would be accompanied by an increase in observable language behaviors since they are both defined as cognitive functions and since their development is dependent, in part, on the child's imitation of observable mother modelling behaviors.

There is a large number of educational programs for infants and young children with the general purposes of facilitating cognitive and language development. (See Lee, et. al., 1970 and Starr, R., 1971, for a review of programs) The review of these studies suggest that some programs can have a positive effect on a young child's cognitive and language development and that this development can be brought about through a variety of intervention techniques. However, the research does not indicate specific methods or materials that are most effective.

The educational programs that focused onlanguage development showed some relationship of particular methods of training and materials to empirical results. These programs emphasized use of professionals for training mothers, mothers as the primary intervention agent, and materials focused ona range of abilities.

As far as is known, there are no studies that have attempted to formulate and test specific materials and methods for increasing a young child's sustained attention to verbal stimuli during the developmental period of 18 to 24 months of age. Therefore, the purpose of this study was to determine an effective parent education program for increasing a young child's level of sustained attention to verbal stimuli during this age period. The general hypotheses of this study was that by the age of 2 a young child's sustained attention to verbal stimuli is a function of the number and complexity of his action and verbal schema and extent of symbolic thinking. These determinants, in turn, are largely dependent on the child's imitative behaviors during the developmental period of eighteen to twenty-four months of age. Mother modelling of action and verbal patterns appears to be one of the most important sources for the child's imitative behaviors. Therefore, an increase in the number and complexity of mothers modelling action and verbal patterns during the developmental period of 18 to 24 months of age should increase her young child's sustained attention to verbal stimuli.

Procedures

Several necessary developmental activities were undertaken prior to the experimental phase in this study. These activities included the development of a curriculum guide for the experimental treatment, the development of a weekly activity planning book and an evaluation form, both to be used in conjunction with the curriculum guide, and, the development of an appropriate measure of sustained attention to verbal stimuli.

The curriculum guide was developed on the basis of information obtained from the studies of Piaget's theory of cognitive development for young children (1951,1967) Bandura's studies of observational learning (1963, 1964,) 1965) and the studies that described differences in the mother-child relationship that appeared to influence language development. (Deutsch, 1964, 1967; Hess and Shipman, 1965; Labov, 1968; Klaus and Gray 1968; Robinson and Creed, 1968; Bee, et. al., 1969; Cazden, 1970; Hymes, 1970; Nelson, 1970; Olim, 1972).

Six basic propositions for increasing sustained attention to verbal stimuli were derived from the selected sources of information. These propositions were then used for the creation and selection of modelling activities for the curriculum guide. These activities were organized into three sections in the guide and illustrated for the mother a variety of selected action and verbal patterns to model. The major focus in the guide was the increase of the mother's modelling of language and action patterns in familiar daily settings and in specific play-teaching activities. Selected verbal and action patterns introduced in the guide are modelled by the mother, practiced in daily activities and made meaningful by their daily frequency and the use of related materials and toys. The purpose of increasing mother's modelling action patterns with appropriate language patterns was to provide more of the kind of experience that allows the child to learn through observation, subsequently increasing his sustained attention to verbal stimuli.

The Weekly Planning Book and Observational Record Form were used with the Curriculum Guide. With these forms, the mothers described specific behavioral objectives, activities to reach these goals; and evaluated their activities and their children's progress.

Subjects

Mothers with infants eighteen to twenty-four months of age residing in Northampton and Easthampton, Massachusetts were eligible for the study. From the birth records for Hampshire County as recorded in the daily newspaper, the Hampshire Gazette, one hundred and twenty-six families with children born between the period of October 1, 1969 and March 31, 1970 were called on the phone for the purpose of briefly describing the research study and to ask for their cooperation. A fact sheet and letter with more detailed information about the study was sent to sixty-five of the mothers who expressed interest in the project. Fifty-two of the sixty-five families returned the fact sheet confirming their desire to participate in the study. Forty-two mothers and their children were randomly selected for the testing sample from these fifty-two families residing in Northampton and Easthampton.

Treatments

The forty-two mothers and their children were randomly assigned to three treatment groups: Full-Treatment, Partial Treatment, and a No-Treatment. Each mother in the Full Treatment was given a curriculum guide, a weekly activity planning book, and an evaluation form. The mothers in the Partial Treatment did not receive these materials. There was three, two-hour training sessions, the trainer discussed the use of the curriculum guide, weekly activity planning book, and evaluation form. The trainer demonstrated examples of modelling activities, games, and arts and crafts activities from the guide. The mothers in the Partial Treatment receive one, two-hour home training visit. During this visit, each mother was asked by the trainer to model more and new language and action patterns during the day and in specific play-teaching

PS 007459

situations with her child. The trainer demonstrated modelling patterns using common household materials and suggested some activities that would incorporate these new modelling behaviors. The mothers were asked to keep a list of new words, phrases, and sentences during the experimental period.

After the home visits for assessment and training, that extended over a period of one month, each mother in the Full Treatment was visited, by the trainer, three times during the remaining experimental period of three months. During these home visits, the trainer reviewed and evaluated with the mothers the activities in the program. Each mother in the Partial Treatment was visited twice during this three month period for reciew and evaluation. Mothers in the Full Treatment attended three group meetings for all the mothers. During those meetings they discussed the program and shared their ideas and activities. Mothers in the Partial Treatment did not attend group meetings.

Measures

A pre-post design was used with the following measurement instruments: 1) Bayley Scale of Mental Development, 2) Schaefer and Burgoon's Language Development Checklist, and the 3) Sustained Attention to Verbal Stimuli Assessment.*

The Bayley Scale of Mental Development (Bayley, 1966) is one of the three parts of the Bayley Scales of Infant Development. The Mental Scale is designed to assess sensory-perceptual acuities, discriminations, and the ability to respond to these; the early acquisition of "object constancy" and memory, learning and problem-solving ability; vocalizations and the beginnings of verbal communication; and the early evidence of the ability to form generalizations and classifications. The Standardization sample used for the Bayley Scales of Infant Development consisted of 1,262 children stratified according to age, sex, color, urban-rural residence and educational attainment of the head of the household. The Mental Scale is divided into two parts of approximately equal length

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*There was no satisfactory instrument to measure sustained attention to verbal stimuli in infants and young children. Therefore, it was necessary to develop such an instrument. Kagan (1968) has recommended use of quality of short-term memory, fixation time, eye-tracking patterns, cardiac deceleration, and quality of performance on continuous vigilance tasks, as a partial operations for attention. The indexes of performance on continuous vigilance tasks, short-term memory, and orientation time were used as measurements of sustained attention to verbal stimuli because of their relative ease in assessment.

for computing co-efficients of reliability. The reliability co-efficients for the Mental Scale range from .81 to .93 with a median value of .88. The Standard error of measurement for the scale ranges from 4.2 to 6.9 standard score points.

The Schaefer and Burgoon's Language Development Checklist evolved from the Washington D.C. Infant Education Research Project (1969). It consists of forty-four items. There is a developmental progression of items with beginning items at a pre-verbal level and progressing to items reflecting verbal behavior of a three to four year old child.

The Sustained Attention to Verbal Stimuli Scale consisted of three sections: 1) Quality of Performance on Continuous Vigilance Tasks, 2) Quality of Short-Term Memory, and 3) Orientation Time. For Quality of Performance on Continuous Vigilance Tasks, parts of the Piagetian Infancy Scales for Development of Vocal and Gestural Imitation, the Early Language Assessment Scale, and the Illinois Test of Psycholinguistic Abilities were adapted for use in assessing this dimension. There are eleven items in this section. For Quality of Short-Term Memory, part of the subtest for auditory memory of the Illinois Test of Psycholinguistic Abilities was adapted for use in measuring this dimension. There is one item in this section. For Orientation Time, one of Kagan's (1968) measures of attention to auditory stimuli was adapted for assessing this dimension. The one item in this section assesses motor and vocal activity for obtaining the length of orientation time for an evaluation of differences to auditory stimulation.

Since the rationale for the study and since the content of the Curriculum Guide assume that changes in children's performance occur through changes in mother's modelling behaviors; and since the children's performance in the Full Treatment and Partial Treatment groups could significantly improve, it seemed worthwhile to examine the informal evidence for specific indications of the changes in mother's modelling behaviors that would be related to the Full and Partial Treatment programs. There were two sources of informal evidence: 1) the mother's written reports and, 2) the trainer's written reports.

Data Analysis

Although the six hypotheses only called for comparisons between the Full Treatment Group and each of the two comparison groups, an additional comparison between the Partial Treatment Group and the No Treatment Group was made. It seemed important to show that whatever effects produced by the Full Treatment program in comparison to the No Treatment were not simply results of attention, time, and a theoretical orientation given to the mothers by the experimentor. In order to indicate that it is the specific training activities, materials, and behaviors that produced the predicted effects, a Partial Treatment Group was included for comparison. Evaluation of the effects of the Partial Treatment required two comparisons. First, with the Full Treatment group to see if there was any additional yield from the extended training, home visits, and the Curriculum Guide and associated materials; and second, with the No Treatment group to see if the Partial Treatment program of less training, home visits, and no materials had any effects at all.

The parallel non-parametric Mann-Whitney Test was used for all comparisons. This test is appropriate when two samples are not composed of matched pairs and may be of unequal size. (Mosteller & Bush, 1954) Tables of ranks and of Z scores were presented for each hypotheses.

Results

Five of the six hypotheses predicted significantly improved as a result of the Full Treatment program: 1) The Bayley Scale of Mental Development Score, 2) Language Development Checklist Score, 3) Quality of Performance on Continuous Vigilance Tasks, 4) Orientation Time to Verbal Episodes, and 5) Overall Sustained Attention to Verbal Stimuli Score. A sixth hypotheses predicted, Quality of Short Term Memory, improved for the children in the Full Treatment group of mothers in comparison with the children in the Partial Treatment group of mothers. There was no significant difference for the children in the Full Treatment group of mothers in comparison with the children in the No Treatment group of mothers

for Quality of Short Term Memory. One significant difference was evidenced on the Overall Sustained Attention to Verbal Stimuli Score for the Partial Treatment effect in comparison with the No Treatment.

TABLE I

COMPARISON OF PRE- and POST TREATMENT

SCORES FOR THE SIX HYPOTHESIZES

AMONG THE FULL, PARTIAL AND NO TREATMENT GROUPS

		Pre-Treatment	Post-Treatment
Language Development Checklist	Full vs. Partial Treatment	Z = 1.37 (ns)	Z = 2.86 ***
	Full vs. No Treatment	Z = 0.38 (ns)	Z = 2.18 *
	Partial vs. No Treatment	Z = 1.74 (ns)	Z = 1.33 (ns)
Bayley Scale of Mental Development	Full vs. Partial Treatment	Z = 0.68 (ns)	Z = 2.76 ***
	Full vs. No Treatment	Z = 0.21 (ns)	Z = 1.91 *
	Partial vs. No Treatment	Z = 0.38 (ns)	Z = 0.04 (ns)
Quality of Performance on Continuous Vigilance Tasks	Full vs. Partial Treatment	Z = 1.82 (ns)	Z = 3.53 ****
	Full vs. No Treatment	Z = 0.38 (ns)	Z - 3.13 ****
	Partial vs. No Treatment	Z = 1.89 (ns)	Z = 1.71 *
Quality of Short Term Memory	Full vs. Partial Treatment	Z = 1.19 (ns)	Z = 2.35 **
	Full vs. No Treatment	Z = 0.68 (ns)	Z = 0.85 (ns)
	Partial vs. No Treatment	Z = 0.27 (ns)	Z = 0.38 (ns)

Orientation Time To Verbal Episodes	Full vs. Partial Treatment	Z = 0.00 (ns)	Z = 2.65 ***
	Full vs. No Treatment	Z = 0.72 (ns)	Z = 2.73 ***
	Partial vs. No Treatment	Z = 0.57 (ns)	Z = 0.61 (ns)
Overall Sustained Attention To Verbal Stimuli Score	Full vs. Partial Treatment	Z = 1.02 (ns)	Z = 3.45 ****
	Full vs. No Treatment	Z = 0.76 (ns)	Z = 2.94 ****
	Partial vs. No Treatment	Z = 1.67 (ns)	Z = 1.85 *

* $p < .05$ ** $p < .01$ *** $p < .005$ **** $p < .001$

The analysis of the mothers' and trainer's written reports indicated that most of the Full Treatment mothers changed their modelling behaviors. This informal evidence also suggested that to increase young children's sustained attention to verbal stimuli, it is important that mothers have interest in learning how to increase this area of development, that they are willing to change their modelling behaviors, that they daily, and consistently apply the new and expanded modelling behaviors, and that they have good observational skills, The reports indicated that if mothers are to maintain and develop these behaviors and attitudes, they should experience an educational program that includes training sessions in the home, monthly home visits, group meetings, a curriculum guide, a planning book and an observational record form.

Discussion

The statistical results and the evidence from the mothers' and trainer's reports did indicate that the Full Treatment program consisting of a four-month intervention period, with three two hour training sessions in the home, three monthly home visits, three group meetings for all the mothers, and use of a Curriculum Guide, Planning book and Observational Record form significantly increases sustained attention to verbal stimuli in comparison with the Partial Treatment Program consisting of one training session in the home, two home visits, and no materials; and in comparison with a No Treatment program. The effective intervention program for mother education aimed toward increasing young children's sustained attention to verbal stimuli has a number of implications.

The results suggest that an important period for increasing the development of sustained attention to verbal stimuli is eighteen to twenty-four months of age when a young child has increased capacities for imitation of modelled acts. The results suggest that sustained attention to verbal stimuli is a function of cognitive development and is related to the degree of language development.

The result indicate that mother modelling of particular action and language patterns is an important factor for increasing sustained attention to verbal stimuli and for increasing language development and mental development. This mother modelling includes 1) verbal stimuli for naming objects and actions upon those objects, 2) verbal stimuli for describing familiar and new action patterns, 3) verbal stimuli that are repetitions of children's responses, 4) verbal stimuli that expand on children's responses, 5) verbal stimuli that reinforce and reward certain types of children's verbal behaviors, 6) verbal stimuli in the form of directions and questions for problem-solving situations, and 7) verbal stimuli that encourage children to use their own words and phrases to express their own thoughts and feelings.

In addition, the results of this study suggest that training mothers in the home can be successful. Several features of this study's home program seemed important for the mother's participation. First, the program should consist of a specified training procedure, home visits, group meetings for all the mothers, a curriculum guide, a planning book and an observational record form. The program should focus on behaviors that are defined in observable terms and that are based on a rationale that consists of already existing observable behaviors for the mother and child. There should be several home visits during the intervention period. Monthly meetings for all the mothers in the program appear to be important for developing a sense of enthusiasm and support among the mothers. These meetings provided for the mothers an opportunity to share a variety of ideas and concerns and to learn from other mothers; and finally, intervention programs that are specified in terms of the training, materials, and target behaviors that are appropriate for the children's developmental period can be of short duration, as little as five hours of training for mothers and a four month experimental period.

This study indicates several needs for additional future research First, since the results from this study are generalizable only to a small population, there is a need for more studies with the same general population as defined in this study; and for research studies that would use the same

treatments, but for different populations in order to assess the effect of different treatment effects as influenced by characteristics of the population than by differences in the treatments themselves. Second, there is a need to assess long-term gains for children in the Full Treatment group so as to determine whether the gains are long lasting, or enter into any formal school situation.

This study did not assess the relative effects of various components of the program. There is no evidence that suggests if all six propositions that define the specific modelling patterns for mothers are all equally important for increasing sustained attention to verbal stimuli and language skills. This question would be difficult to answer since the six propositions are similar in content and in general, one or more are combined in one modelling act. It would be of more importance to ascertain the relative effectiveness of the Curriculum Guide that incorporates these six propositions for increasing sustained attention to verbal stimuli as compared to the training process that teaches these propositions through demonstrations, discussions, mother practice, three home visits and the group meetings; or to assess the relative effectiveness of the guide and the training as compared with the three home visits and the group meetings, or only with the group meetings. This study suggested that both the home visits and the group meetings were important for mothers' participation in the program. How important they were in relation to the initial training and/or to the Curriculum Guide can be answered by future research.

In conclusion, this study had the primary goal of developing a specific skill for specific purposes, and it used methods and materials that corresponded to existing knowledge about learning and early childhood development. This study showed that early childhood education can be efficacious, but more importantly, it suggested when and how to intervene, with what experiences, and for what specific benefits. Therefore, this study does seem to represent a useful unit of research for three areas: 1) early childhood development, 2) educational intervention programs for young children with parent involvement, and 3) the development of training and educational materials for mothers.

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